THE AECIAL STAGE OF COLEOSPORIUM RIBICOLA

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On a recent field trip to Bear Canyon, located in the Sandia Mountains about twelve miles from Albuquerque, New Mexico, the writer found a Peridermium on the needles of piñon (*Pinus edulis*). The infected piñons were growing in close proximity to *Ribes leptanthum,* which is rather common near the bottoms of canyons. Several days later, a trip was made to Tejano Canyon, about twenty-eight miles from Albuquerque, where the Peridermium was again found on piñon in close association with Ribes plants.

Inoculations under control conditions were made on two species of Ribes from both of the collections. Sowings of aeciospores from the Bear Canyon material (F.P. 21164) were made April 29 on *Ribes leptanthum* and *R. longifolium.* On May 16 the uredinia of a Coleosporium appeared on the lower surface of the leaves of *R. leptanthum* (the *R. longifolium* plants which were inoculated damped off). Sowings of the aeciospores from the Tejano Canyon material (F.P. 21165) were made May 3 on *R. leptanthum* and *R. longifolium.* Uredinia appeared May 18 on the lower side of the leaves of both of the species of Ribes inoculated. The control plants of each set of inoculations remained free from the rust.

The Coleosporium obtained by inoculating the Ribes plants with the aeciospores of the Peridermium from piñon proved to be identical in all its characters with *Coleosporium ribicola* (E. & E.) Arthur. This infection of the Ribes leaves by the piñon Peridermium, thereby producing the typical uredinia of *C. ribicola,* proves that this Peridermium is the aecial stage of *C. ribicola* and should be called *Peridermium ribicola.*

A technical description of the aecial stage of this fungus is given below.

PERIDERMIUM RIBICOLA

O. Pycnia amphigenous, scattered, sparse, low, conoidal, subcorticular, noticeable, dehiscent by a longitudinal slit, chestnut-brown, 0.5–1 mm. long by 0.3–0.5 mm. broad, about 100 μ tall.

I. Aecia from a limited mycelium, amphigenous, one to several on each leaf, not forming spots on leaves, erumpent from a narrow slit, flattened laterally, 0.5 to 1 mm. long by 0.5 to 0.8 mm. high; peridium colorless, fragile, cells slightly or not at all overlapping, outer walls smooth to slightly granular, inner moderately verruculose, lower peridial cells elliptical, lanceolate or oval, 33–50 by 16–24 μ, walls 2–3 μ thick, upper peridial cells approximately isodiametric, irregularly orbicular, 18–30 μ across, walls 2–4 μ thick; aeciospores elliptical-oblong, oval or obovate, 20–28 $\times$ 30–43 μ, average size for ten spores 23.7 $\times$ 36.2 μ; walls colorless, 2–3 μ thick, verrucose, with rather coarse irregular warts, which are tardily deciduous, without a smooth area on spore walls.

Both collections of *Peridermium ribicola* were made at an elevation of about 7,500 feet near the upper limit of the range of piñon in these two canyons (Bear and Tejano). Snow was still on the ground in the upper portion of the canyons and the ground was still frozen on some of the more protected slopes in the immediate vicinity of the infected piñons. The season was so early that a snow storm occurred while the writer was collecting the rust. Both collections had already discharged most of their spores. The above facts indicate that the peridia of this Peridermium were probably well developed before all of the snow had disappeared from under the piñons.

No indications of the aecial stage of this fungus were found below 6,500 feet elevation, although the piñon was still abundant.

The comparatively high altitude (for the aecial host) at which this Peridermium occurs and its very early appearance in the spring will probably explain why it has not been discovered before.

The coleosporial stage occurs at much lower elevations than the aecial since the writer found the rust on Ribes plants in Albuquerque (4,950 feet elevation). The coleosporial stage evidently reaches these lower altitudes through the successive infection of the Ribes plants throughout the summer months by the urediniospores, thereby materially extending the range of the rust beyond that of its aecial stage.

The coleosporial stage of this rust has been reported on the following species of *Ribes: R. grossularia* Linn., *R. inebrians* Lindl., *R. leptanthum* A. Gray, *R. longifolium* Nutt., *R. pumilum* Nutt., *R. purpusii* Koehne, and *R. valicola* Greene, and from three states, Colorado, New Mexico, and Wyoming. The writer has collected this Coleosporium on *R. mescalerium* Coville in Amole and La Junta Canyons, Santa Fe National Forest, New Mexico, October, 1914 (F.P. 21162 and 21161) and on *R. longifolium,* Albuquerque, New Mexico, October, 1914 (F.P. 21163).

Pinus edulis, the aecial host, occurs in Colorado, western Texas, eastern Utah, southwestern Wyoming, northern and central Arizona, New Mexico, and southward into Mexico. The known distribution of the coleosporial stage of this rust is, therefore, well within the range of its aecial host (*P. edulis*) and it is very probable that *Peridermium ribicola* will also be found to have practically the same general range.

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